

II. CLAIMS

This listing of claims replaces all prior versions, and listings, of claims of the application.

1-20. (Cancelled).

21. (Currently amended) A mounting system for a pellicle comprising:

a mounting structure for coupling a pellicle to a mask, wherein a sealed interior portion is formed between the pellicle, the mask and the mounting structure; and

a pressure regulator in communication with the sealed interior portion to control a pressure in the interior portion, wherein the pressure regulator is coupled to a device for measuring the pressure in the interior portion.

22. (Previously presented) The mounting system of claim 21, further comprising a source of high pressure gas coupled to the pressure regulator, and a source of low pressure gas coupled to the pressure regulator.

23. (Previously presented) The mounting system of claim 22, wherein one of the sources of pressure gas is the exterior environment.

24. (Previously presented) The mounting system of claim 21, further comprising a pressure sensor operatively coupled to the pressure regulator for detecting a pressure of the interior portion.

25. (Previously presented) The mounting system of claim 21, further comprising a position sensor operatively coupled to the pressure regulator to determine the position of the pellicle;

wherein the pressure difference is controlled by the pressure regulator to maintain a flat surface on the pellicle based on a reading from the position sensor.

26. (Previously presented) The mounting system of claim 21, further comprising a velocity sensor operatively coupled to the pressure regulator to determine the velocity of the pellicle;

wherein the pressure difference is controlled by the pressure regulator to maintain a flat surface on the pellicle based on a reading from the velocity sensor.

27. (Previously presented) The mounting system of claim 21, further comprising a calibrated leak from the interior portion to an exterior environment.

28. (Previously presented) The mounting system of claim 21, further comprising an aerodynamic fairing adjacent the mounting structure.

29. (Previously presented) The mounting system of claim 21, wherein the pressure regulator communicates with the sealed interior portion through a port in the mounting structure.

30. (Previously presented) A pellicle mounting system for a mask, the mounting system comprising:

an aerodynamic fairing adjacent the mask, the fairing having a taper to reduce aerodynamic drag on the pellicle and a portion that is co-planar with the pellicle.

31. (Previously presented) The mounting system of claim 30, further comprising:

a mounting structure for coupling the pellicle to the mask, wherein a sealed interior portion is formed between the pellicle, the mask and the mounting structure; and
a pressure regulator to adjust a pressure in the interior portion.

32. (Previously presented) The mounting system of claim 31, further comprising a position sensor operatively coupled to the pressure regulator to determine the position of the pellicle;

wherein the pressure difference is controlled by the pressure regulator to maintain a flat surface on the pellicle based on a reading from the position sensor.

33. (Previously presented) The mounting system of claim 31, further comprising a velocity sensor operatively coupled to the pressure regulator to determine the velocity of the pellicle;

wherein the pressure difference is controlled by the pressure regulator to maintain a flat surface on the pellicle based on a reading from the velocity sensor.

34. (Previously presented) The mounting system of claim 30, wherein an aerodynamic fairing is provided adjacent each end of the mask that faces a direction of movement of the mounting system.

35. (Previously presented) The mounting system of claim 34, further comprising a retractable plate for providing a substantially continuous surface between the aerodynamic fairings.

36. (Previously presented) The mounting system of claim 30, wherein the taper extends to a mask stage and the portion is adjacent the pellicle, and further comprising a curved surface extending between the taper and the portion.

37. (Currently amended) A method of reducing distortion of a pellicle for a mask, the method comprising the steps of:

sealing the pellicle to the mask using an airtight mounting structure such that an interior portion is created between the pellicle, the mask and the mounting structure; and

regulating a pressure in the interior portion to reduce distortions in the pellicle, wherein the pressure regulating step includes measuring the pressure in the interior portion.

38. (Previously presented) The method of claim 37, further comprising the step of providing an aerodynamic fairing adjacent the mask to reduce turbulent airflow across the pellicle.

39. (Previously presented) The method of claim 37, wherein the pressure is regulated according to feedback from at least one of a pressure sensor coupled to the interior portion, a position sensor for the pellicle, and a velocity sensor for the pellicle.

40. (Previously presented) The method of claim 37, wherein the regulating step includes regulating the pressure to maintain a flat surface on the pellicle.

III. REMARKS

Claims 21-40 are pending in this application. By this amendment, claims 21 and 37 have been amended. The above amendments and the following remarks are being made to facilitate early allowance of the presently claimed subject matter. Applicant does not acquiesce in the correctness of the objections and rejections and reserves the right to present specific arguments regarding any rejected claims not specifically addressed. Reconsideration in view of the following remarks is respectfully requested.

In the Office Action, claims 26, 33 and 35 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in an independent form. Applicant gratefully appreciates this indication, although Applicant submits that rewriting those dependent claims is not necessary because they are allowable both for their own additional features and for their allowable base claim.

By the Amendment, claims 21 and 37 have been revised to clarify the features of the invention. Applicant submits that the revision does not affect the patentability of the claimed subject matter.

In the Office Action, claims 21-27, 32, and 39-40 were rejected under 35 U.S.C. 102(e) as being anticipated by Sato (USPN 6,791,661); claims 21-24, 27, and 39-40 were rejected under 35 U.S.C. 102(e) as being anticipated by Nakano (USPN 6,788,392); claims 21, 29 and 37 were rejected under 35 U.S.C. 102(e) as being anticipated by Yasuda et al. (US 2003/0016338 A1); and claims 28, 30-31, 34 and 36-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over either Sato or Nakano, in view of Sego (USPN 6,055,040). Applicant respectfully submits that the claimed subject matter is allowable for the reasons stated below.

Applicant first notes that with regard to the rejections based on Sato and Nakano, the Office erroneously rejected dependent claims 32 and 39-40, without rejecting their base claims 30 and 37 respectively. Applicant assumes that those dependent claims are not rejected, however, clarification is respectfully requested.

Second, with respect to claim 21 and 37, Sato (relevant only to claim 21), Nakano (relevant only to claim 21), or Yasuda et al. do not anticipate the claimed subject matter. Sato discloses "[an] exposure apparatus [that] includes a preliminary chamber which accommodates a mask on which a pellicle is attached." Abstract. The Sato apparatus includes a deformation measuring device 85 and a control section 9. See Fig. 3 of Sato. In Sato, the deformation measuring device 85 "measures the deformation of the pellicle PE" (col. 11, lines 62-63), and the pellicle deformation is caused by "a pressure change in the mask-gas replacement chamber 7." Col. 11, lines 34-35. In Sato, "[t]he control section 9 compares the result of the measurement from the deformation measuring device 85 with the deformation information stored in the memory device 86A and controls ... the exhaust valve 84, ...the exhaust pump VP1, ... the intake valve 83 and ... an intake pump P5 " Col. 12, lines 22-28. The Sato apparatus controls the pressure in the mask-gas replacement chamber 7. However, this chamber is exterior to "the space GS formed between the pellicle PE and the mask M[.]" Col. 11, lines 27-28. As a result, Sato only indirectly controls the pressure inside space GS. More importantly, Sato does not disclose, *inter alia*, "a device for measuring the pressure in the interior portion[.]" as the current invention does. Claim 21 of the current invention. In view of the foregoing, Sato does not anticipate the claimed subject matter.

Nakano discloses "a purging mechanism for purging out air in a pellicle space with an inert gas[.]" Col. 7, lines 42-43. The Nakano mechanism includes "a flow regulator 33 ... [and]

a pressure sensor 31 [that] is connected to pressure propagating paths d, e for detecting both the pressure in the inert gas supply nozzle 29 and the pressure in a space of the airtight chamber 36 where the pellicle is placed, or the difference between both the pressures.” Col. 8, lines 20 and 22-26. In Nakano, both the pressures detected are outside of an interior portion between the pellicle, the mask and the mounting structure. *See* Fig. 2 of Nakano. Nakano does not, *inter alia*, measure and control “a pressure in the interior portion[, which is] formed between the pellicle, the mask and the mounting structure[.]” as the current invention does. Claim 21 of the current invention. In view of the foregoing, Nakano does not anticipate the claimed subject matter.

Yasuda et al. disclose a mask-deflection detection system. In Yasuda et al., the U-type mask-deflection correction unit 38 is a one-piece unit, which is attached to mask 10. *See* Fig. 1 and Paragraph 0089. Yasuda et al. do not disclose, *inter alia*, a pellicle and “a mounting structure for coupling a pellicle to a mask[.]” Claim 21 of the current invention (claim 37 includes the similar feature). (Emphasis ours). In view of the foregoing, Yasuda et al. do not anticipate the claimed subject matter.

Turning to the obviousness rejections, with respect to claim 30, Sato and Sego or Nakano and Sego do not make the claimed subject matter obvious, because the combinations do not disclose or suggest each and every claimed feature. As the Office admitted, Sato and Nakano do not disclose or suggest, *inter alia*, “an aerodynamic fairing,” as recited in claim 30. Sego discloses “[a] pellicle which reduces the number of particles that migrate onto a stepping field of the mask[.]” Abstract. The pellicle frame includes “[a] pellicle membrane [that] is attached to the top of the outer wall and stretches over the rounded top of the inner wall, which has a slightly greater height than the outer wall.” Abstract; *see also* Fig. 4. However, the membrane in Sego

is by no means similar to the aerodynamic fairing of the current invention. The membrane in Sego does not include, for example, “a taper to reduce aerodynamic drag on the pellicle and a portion that is co-planar with the pellicle[.]” as recited in claim 30 of the current invention. (Emphasis ours). Applicant also submits that the Office’s citation to col. 7, lines 45-56 of Sego does not support the Office’s statement. In particular, the air flow discussed in that citation is apparently internal to the pellicle and mounting structure. Sego uses widen channels (271, 272) to reduce turbulent air flow in the channels, which might otherwise carry along small particles into the protected area. See col. 7, lines 52-61. Sego does not provide any disclosure regarding reducing “aerodynamic drag on the pellicle,” as the current invention does. In Sego, the membrane is not used to “reduce aerodynamic drag on the pellicle” (claim 30 of the current invention), but to “form a protected area[.]” Col. 2, line 35 of Sego. Accordingly, it is incomprehensible how Sego provides an aerodynamic fairing having a taper to reduce aerodynamic drag on the pellicle and a portion that is co-planar with the pellicle.

In addition, there is no motivation or suggestion in either Sato, Nakano, or Sego, or in a person having ordinary skill in the art to combine Sato or Nakano with Sego, except for the hindsight teaching of the current invention. In Sego, the membrane, together with a frame, “form[s] a protected area that lies over the stepping field of the reticle.” Col. 2, lines 34-36. In contrast, both Sato and Nakano relate to replacing gas from a chamber, and are not concerned with protecting the pellicle. In addition, Sato and Nakano are not concerned with “reducing the deformation of the pellicle due to the effect of the air turbulence when the mask is moving” (Office Action at page 5), because during the air replacing (purging) in Sato and Nakano, the mask simply does not move. In view of the forgoing, even if we assume, *arguendo*, that the membrane of Sego is similar to the aerodynamic fairing in the current invention, it is

incomprehensible why a person having ordinary skill in the art would modify Sato or Nakano to incorporate Sego. The Office's asserted motivation could only be produced by the hindsight teaching of the current invention.

The Office asserts that Eynon (USPN 6,524,754) discloses a mounting structure for a pellicle and comprises substantially all elements as recited in the currently claimed subject matter. Applicant reviewed Eynon and submits that the current invention is distinctive from Eynon.

In view of the foregoing, Applicant respectfully requests withdrawal of the rejections.

Claims 22-29 are dependent upon claim 21, claims 31-36 are dependent upon claim 30, and claims 38-40 are dependent upon claim 37. Those dependent claims are believed allowable for the same reasons state above, as well as for their own additional features.

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